Date: دوازدهم بس Sub: تکلیف ۱۵ بنام خدا امیرعلی نورملکی

۱)

$y=\tan\left(-2x+\frac{\pi}{4}\right)$

$\Rightarrow x=0 \Rightarrow y=\tan\frac{\pi}{4}=1$

$T=\frac{\pi}{|-2|}=\frac{\pi}{2} \Rightarrow AC=\frac{\pi}{2} \Rightarrow S_{ABC}=\frac{\pi}{2}\times 1\times\frac{1}{2}=\frac{\pi}{4}$

۲)

$x^2-(\sin\alpha)x-\frac{1}{4}\cos^2\alpha=0$

$x=\frac{2}{3} \Rightarrow \frac{4}{9}-\frac{2}{3}\sin\alpha-\frac{1}{4}\cos^2\alpha=0 \Rightarrow \frac{16-(24\sin\alpha-9\cos^2\alpha)}{36}=0$

$24\sin\alpha+9(1-\sin^2\alpha)=16 \Rightarrow 9\sin^2\alpha-24\sin\alpha+7=0$

$\Rightarrow (3\sin\alpha-7)(3\sin\alpha-1)=0 \Rightarrow \sin\alpha=\frac{1}{3} \Rightarrow \cos^2\alpha=\frac{8}{9}$

$\Rightarrow 1+\tan^2\alpha=\frac{1}{\cos^2\alpha} \Rightarrow \frac{9}{8}$

۳)

$\log(\sin\alpha)-\log(-\cos\alpha)=\log 3$

$\Rightarrow -\frac{\sin\alpha}{\cos\alpha}=3 \Rightarrow -\tan\alpha=3 \Rightarrow 1+\tan^2=\frac{1}{\cos^2} \Rightarrow \cos^2\alpha=0.1$

$\sin^2=\frac{9}{10}$

$\Rightarrow \frac{3\sqrt{10}}{10}+\frac{\sqrt{10}}{10}=\frac{4\sqrt{10}}{10}=\frac{2\sqrt{10}}{5}$

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$\sin^4\theta + \cos^2\theta = \frac{4}{9} \Rightarrow \sin^4\theta + 1 - \sin^2\theta = \frac{4}{9}$ (1)

$\Rightarrow \sin^4\theta - \sin^2\theta + \frac{1}{9} = 0 \Rightarrow 9t^2 - 9t + 1 = 0$

$t = \frac{9 \pm \sqrt{9}}{18} \Rightarrow \cos^2\theta = 1 - t \Rightarrow \frac{9 - \sqrt{9}}{18}$

$\Rightarrow \cos^4\theta = \frac{29 + 9 - 18\sqrt{9}}{100} \Rightarrow \frac{29 - 18\sqrt{9}}{100} = \frac{2 - \sqrt{9}}{10}$

$\Rightarrow \cos^4\theta + \sin^2\theta \Rightarrow \frac{2 - \sqrt{9}}{10} + \frac{9 + \sqrt{9}}{10} = \frac{\Delta}{10} = 0.1$

(5)

$\frac{2\sin\alpha + \sin\alpha\cos\alpha}{2 - 2\cos^2\alpha} < 0 \Rightarrow \frac{\sin(2 + \cos\alpha)}{2(1 + \cos^2\alpha)} < 0$

$\Rightarrow \frac{2 + \cos\alpha}{2\sin\alpha} < 0 \Rightarrow \sin\alpha < 0$ $\Longrightarrow$ (IV)

$\frac{\sin^2\alpha}{\cos\alpha} - \frac{1}{\cos\alpha} > 0 \Rightarrow \frac{-\cos^2\alpha}{\cos\alpha} > 0 \Rightarrow \cos\alpha < 0$

(4)

$\frac{2}{\sin\alpha} + \frac{2}{\cos\alpha} = 0 \Rightarrow \frac{2\cos\alpha + 2\sin\alpha}{\sin\alpha\cos\alpha} = 0 \Rightarrow 2\sin\alpha = -2\cos\alpha$

$\Rightarrow 9\sin^2\alpha = 4 - 4\sin^2\alpha \Rightarrow 13\sin^2\alpha = 4 \Rightarrow \sin^2\alpha = \frac{4}{13} \Rightarrow \cos^2\alpha = \frac{9}{13}$

$\Rightarrow \cos\alpha + \cos\alpha = \frac{2}{\sin\alpha\cos\alpha} \Rightarrow \frac{2}{\frac{2}{\sqrt{13}} \times \frac{3}{\sqrt{13}}} \Rightarrow -\frac{13}{4}$

Elipon

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(V

$$\frac{\sqrt{1+\sin\alpha_0}}{\sin\alpha_0+\sin 1_0} \Rightarrow \frac{\sqrt{1+\cos 4_0}}{\cos 10_0+\cos 4_0} \Rightarrow \sqrt{2\cos^2 2_0} \Rightarrow \frac{\sqrt{2}\cos 2_0}{2\cos^2 4_0+\cos 4_0-1}$$

$$\Rightarrow \frac{\sqrt{2}\cos 2_0}{(2\cos 4_0-1)(\cos 4_0+1)} \Rightarrow \frac{\sqrt{2}\cos 2_0}{(2\cos^2 2_0-2)(2\cos^2 2_0)} \Rightarrow \frac{\sqrt{2}}{2}\times\frac{1}{(2\cos^2-2\cos 2_0)}$$

$$\Rightarrow \frac{\sqrt{2}}{2}\times\frac{1}{\cos 4_0} \Rightarrow \frac{\sqrt{2}}{2}\times 2=\sqrt{2}$$

(A

$$(1-2\sin^2\alpha)(2\cos^2 1_0-1)\left(\frac{1-\tan^2 2_0}{1+\tan^2 2_0}\right)$$

$$(\cos 1_0)(\cos 2_0)(\cos 4_0)\times\frac{\sin 1_0}{\sin 1_0} \Rightarrow \frac{1}{2}\frac{\sin 2_0\cos 2_0\cos 4_0}{\sin 1_0}$$

$$\Rightarrow \frac{1}{4}\frac{\sin 4_0\cos 4_0}{\sin 1_0} \Rightarrow \frac{1}{8}\frac{\sin 8_0}{\sin 1_0} \Rightarrow \frac{1}{8}\frac{\cos 1_0}{\sin 1_0} \hookrightarrow \cot 1_0$$

(9

$$\sin\alpha+2\cos\alpha=2 \Rightarrow \sin\alpha=2-2\cos\alpha$$

$$\Rightarrow \sin^2\alpha=4-12\cos\alpha+9\cos^2\alpha \Rightarrow 1=4-12\cos\alpha+10\cos^2\alpha$$

$$\Rightarrow 10\cos^2\alpha-8-12\cos\alpha=-1 \Rightarrow 8\cos^2\alpha-12\cos\alpha=-1$$

Elipon

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(1.

$\sin\hat{\beta}\sin\hat{C} = \cos^2\frac{\hat{A}}{2}$

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \Rightarrow \frac{bc}{\sin B \sin C} = \frac{a^2}{\sin^2 A}$

$\cos^2\frac{A}{2} \quad 4\cos^2\frac{A}{2}\sin^2\frac{A}{2}$

$4bc\cdot\sin^2\frac{A}{2} = a^2 \Rightarrow 4bc\left(1-\cos^2\frac{A}{2}\right) = a^2$

$\Rightarrow b^2+c^2-2bc\cos A = 4bc\left(1-\cos^2\frac{A}{2}\right)$

$b^2+c^2-bc\left(2\cos A + 4 - 4\cos^2\frac{A}{2}\right)$

$\Rightarrow b^2+c^2-bc\left(2(2\cos^2\frac{A}{2}-1)+4-4\cos^2\frac{A}{2}\right)$

$\Rightarrow b^2+c^2-2bc = 0 \Rightarrow (b-c)^2 = 0 \Rightarrow b=c \Rightarrow \hat{B}=\hat{C}$

$\Rightarrow A = 180 - 144 = 36^\circ$